TASCAM

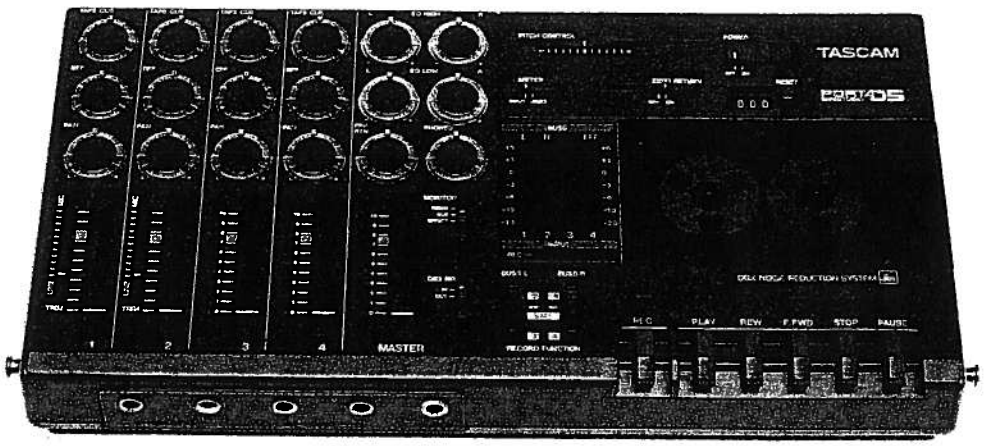
TEAC Professional Division

PORTA 05

MINISTUDIO

01-C-002

Make:TASModel:PORTA 05



OWNER'S MANUAL

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Recording is an art as well as a science. A successful recording is often judged primarily on the quality of sound as art, and we obviously cannot guarantee that. A company that makes paint and brushes for artists cannot say that the paintings made with their products will be well received critically. The art is the province of the artist. TASCAM can make no guarantee that the PORTA 05 *by itself* will assure the quality of the recordings you make.
Your skill as a technician and your abilities as an artist will be significant factors in the results you achieve.

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WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

This appliance has a serial number located on the rear panel. Please record the model number and serial number and retain them for your records.
Model number _____
Serial number _____

This product is manufactured to comply with the radio interference of EEC directive "82/499/EEC."

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

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Understanding what is going on inside your equipment will help improve your sound. Think of this manual as a reference handbook. You won't need all of what is here to begin, and it is certainly not necessary to memorize it, but do try to find the time to read it thoroughly at least once, that way you will be familiar with its contents and if you need answers they will be here waiting.

INTRODUCTION

The MINISTUDIO PORTA 05 is a complete audio production facility in a single box. It contains a full-function mixer with four-input channels, an Effects submixer, a Cue (monitor) submixer, and a Master stereo buss. Also included in the MINISTUDIO is a four-track, four-channel cassette recorder with dbx noise reduction, Pitch Control, and Zero Return. The recorder also features a special Sync Out that ensures that the sychronizing codes used by electronic musical instruments and computer interfaces will be reproduced in the most efficient way.

Using your PORTA 05, you can:

* Record a four-track "Mulitrack Master" tape.
* Mixdown your multitrack master tape to a stereo master using L/R outputs and a stereo recorder.
* Record four mixer channels onto a single recoder track.
* Overdub new signal while listening to prerecorded tracks.
* Ping-Pong (bounce) up to 3 tracks down to one.
* Synchronize electronic musical instrument ("Virtual Tracks") during any recording process using the Sync Out.
* Add effects to any combination of 4 mixer channels using the Effect submixer and Effects Return.

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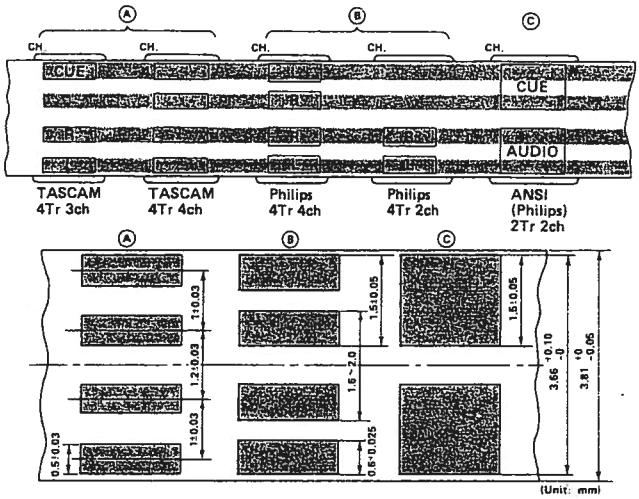
Precautions and Recommendations

1. TRACK FORMAT AND COMPATIBILITY

The track format of the PORTA 05 is compatible with standard (Philips) stereo format tapes that were recorded at 1 7/8 ips (4.75 cm/sec). Noise reduction is a consideration for compatibility. Tapes that have been recorded without noise reduction, or those that have been recorded with dbx type II can be played on the PORTA 05.

If you are in doubt about the compatibility of a tape, you can use this chart of various track layouts as a guide.



The PORTA 05 records and plays in one direction using the whole width of the tape.

2. USE THE SHORTEST POSSIBLE TAPE FOR A GIVEN JOB

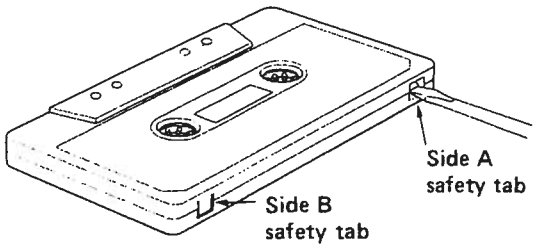
Don't use C-120 tapes under any circumstances; the tape stock is too thin and is not sturdy enough for mulitrack recording.

3. THE PORTA 05 IS INTERNALLY ADJUSTED FOR HIGH BIAS, 70 μs EQ, TYPE II TAPE

This means that you can only use 70 μs, High Bias, Type II tapes such as TDK SAX; MAXELL UD XL IIS or equivalent formulations.

4. TO PROTECT THE FINISHED MASTER, REMOVE BOTH SAFETY TABS OF THE CASSETTE.

If you break out only one tab, you could still put the tape into the PORTA 05 "upside down" and erase the tracks of your master.

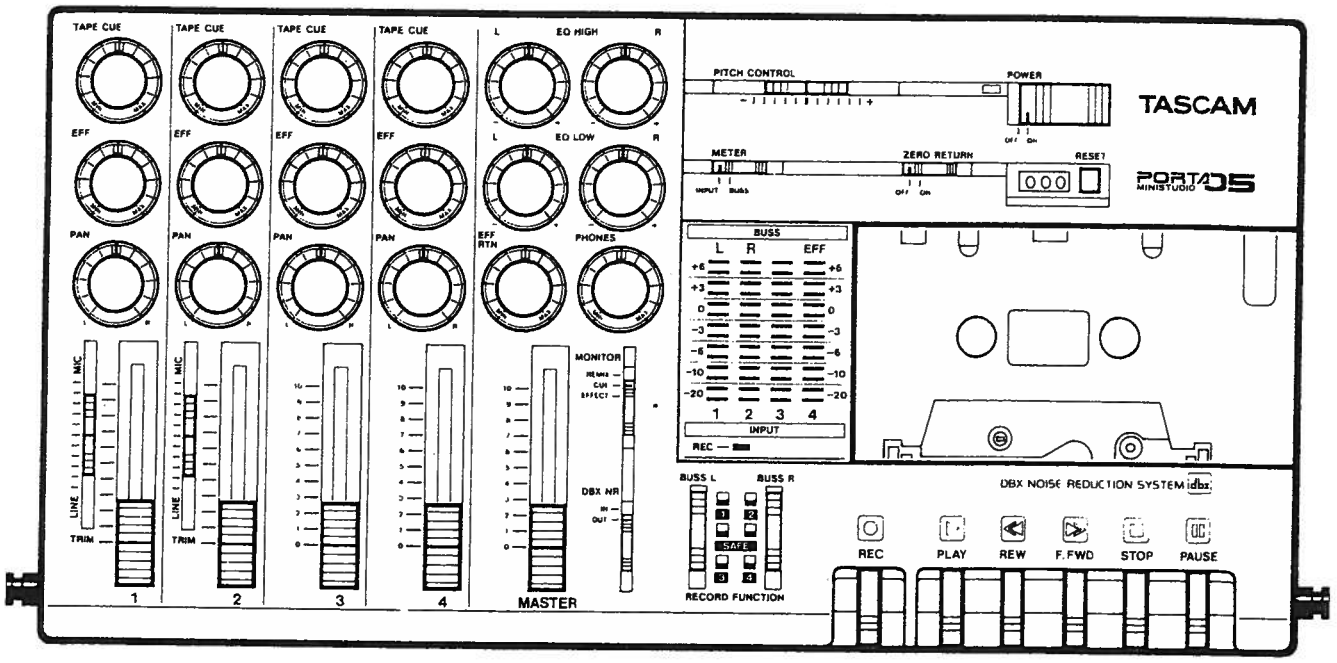


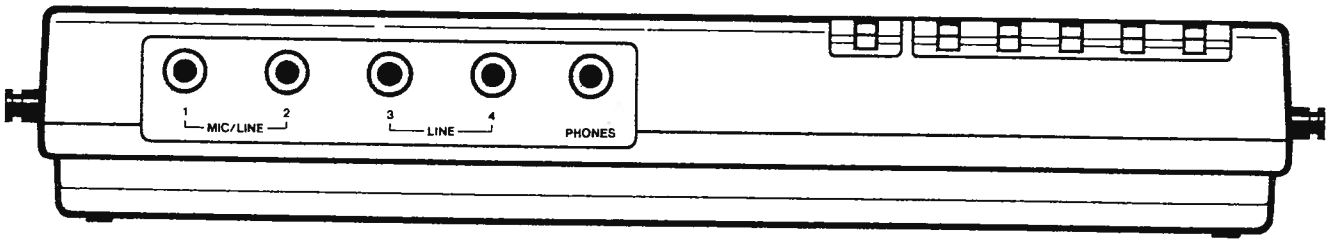
CAUTION: The optional RC-30P Remote Punch In/Out pedal is effective regardless of the removal of safety tabs if either of the RECORD FUNCTION switches are set to the Record Ready mode.

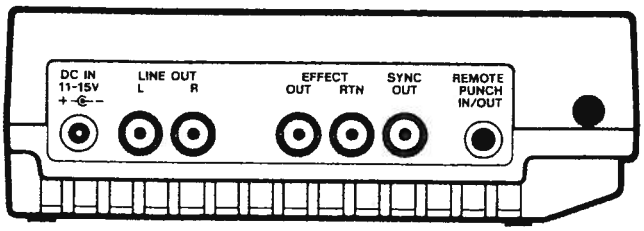
CAUTION

To power the PORTA 05 from an AC line, use the provided AC adapter PS-P2 which is designed especially for the PORTA 05 and provides a convenient connection and correct polarity.

Shoud you attempt to employ an AC-DC converter of any other brand or manufacture, you will have to make sure that the connection provides the proper polarity as shown by the symbols ⊕—●—⊖ above the connector on the left side of the unit. Furthermore, the specified voltage of 11 – 15 V and amperage of 350 mA must be properly observed. Otherwise, damage may occur to the PORTA 05 and *such damage would not be covered by the limited warranty on the product.*







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Recording the First Track

1. Plug a Microphone into channel 1.
2. Plug your headphones into the PHONES output jack. Do not put them on yet.
3. Turn the PORTA 05 on.
4. Set the channel 1 fader to the shaded area.
5. Set the TRIM control to the proper position (a little higher than the center on the scale).
6. Set the channel 1 PAN control to the full LEFT position, fully counterclockwise.
7. Set the EQualizer controls to the 12 o'clock position.
8. Set the MASTER fader to the shaded area.
9. Put the headphones on and, while speaking into the mic, adjust the PHONES level control to a comfortable listening level.
10. Set the METER select switch to the INPUT position.

    NOTE: If you intend to use the EQ, set the METER switch to the BUSS position. The PORTA 05's EQ is located in the L and R Busses (after the PAN controls), not in the channels.

11. Test the signal level by speaking into the mic at a normal volume. If the level is correct, INPUT 1 meter should read between −10 and 0. Adjust your level using the TRIM control.
12. Set the BUSS L (a buss is a circuit) RECORD FUNCTION switch to the track 1 position. The RECord Function LED (Light Emitting Diode) will begin to flash. Set the BUSS R RECORD FUNCTION switch to the SAFE position.
13. Check to make sure the PITCH CONTROL in the center (off) position.
14. Push the PLAY key and allow the tape to run for about 15 seconds. This will run the tape leader onto the take up reel, and put the beginning of the tape in front of the heads.
15. Push the RESET button and set the ZERO RETURN switch to the ON position. This, 1) locates the beginning point of your recording, and 2) allows you to quickly return to this point by simply pressing the REWind key.
16. Press the RECord key. You are now recording on track 1. The RECord Function LED will stop blinking and stay on steadily.

    NOTE: As a suggestion, try recording yourself counting only the odd numbers from 1 to 59, pausing briefly between each.

17. Once you have recorded for about a minute, or you reach 59, push the STOP key. The tape will stop moving, and the RECord Function LED will begin to blink again.
18. Press the REWind key. The tape will rewind to 000 and stop, since the ZERO RETURN switch is in the ON position.
19. Set the BUSS L RECORD FUNCTION switch to SAFE. The LED will turn off.
20. Set the MONITOR select switch to the CUE position.
21. Play the tape and adjust the track 1 TAPE CUE control until the headphone volume is comfortable.

At this point, you have completed the first track, also called a take or pass. If the recording quality and level are OK, proceed to the next step, recording the second track.

Recording the Second Track (Overdubbing)

Using the same basic set-up as before, make the following changes:

1. Set the BUSS R RECORD FUNCTION switch to the track 2 position. The RECord Function LED will begin to blink.

2. Turn the channel 1 PAN control all the way to the right (clockwise). Make sure the MASTER fader is in the shaded area between 7 and 8.

   NOTE: Changing the MASTER setting will change your record level.

3. Listening through the headphones, push PLAY and begin speaking into the mic. Balance the volume setting of the new signal to that of the track 1 playback level by using TAPE CUE 1 and PHONES controls.

4. Rewind the tape.

5. Press RECord. The RECord Function LED will stay on. The second track is now being recorded. Since track 1 can be heard through the headphones along with the new signal, the second track can be recorded "in sync" with the first.

   NOTE: If you followed our suggestion and recorded odd numbers on track 1, you can now record the even numbers on track 2. Since you can hear the pauses between the odd numbers, you should try to record the even numbers during these pauses.

6. Once you have recorded to the end of the first track, or have counted to 60, push STOP and then REWind. This will return the tape to the beginning.

7. Set the BUSS R RECORD FUNCITION switch to SAFE.

8. Push PLAY and listen to the two tracks. Adjust the track 1 and 2 TAPE CUE controls to the desired level and balance.

Recording Tracks 3 and 4

The method used for recording the third and fourth tracks is vertually the same as the first and second. The differences are in the PAN settings and the RECORD FUNCTION switch positions. To record on track 3, all the basic settings are the same as before, with the following changes:

1. Set the BUSS L RECORD FUNCTION switch to track 3 and BUSS R switch to SAFE.

2. Turn the channel PAN control all the way to the left.

For recording on track 4, the method is reversed;

1. Set the BUSS R RECORD FUNCTION switch to track 4 and the BUSS L switch to SAFE.

2. Turn the channel PAN control all the way to the right.

Once these steps are done, the rest is merely balancing the levels of the playback signals with the new material.

Ping-Ponging or Collapsing Tracks

The recording capability of the PORTA 05 is not limited to just the four tracks, however. As you progress with your recording, you may reach a point where you need more than four tracks of material. This is where PING-PONGING or COLLAPSING tracks is invaluable. This allows you to combine two or three tracks onto the remaining blank track while recording new material.

If you have recorded tracks 1 and 2, and, perhaps, track 3 as well, follow the steps below to put them all onto track 4.

1. Check to make sure that all inputs are removed from the MIC/LINE and LINE connecters. The input channels are now internally switched to Tape.

2. Set the BUSS R RECORD FUNCTION switch to track 4 and the BUSS L switch to SAFE. The RECord Function LED will begin blinking.

3. Set channel faders 1 through 3 to the shaded area between 7 and 8.

4. Set the MASTER fader to 7.

5. Set the PAN controls (1, 2, 3) all the way to the right (fully clockwise).

6. Rewind the tape to 000.

7. Set the MONITOR switch to the CUE position, turn the TAPE CUE controls all the way down.

8. Push the PLAY key and listen to the mix. Make any necessary level adjustments using the channel and MASTER faders. You may want to repeat this step several times to get the balance correct.

9. When the balance is right and the level is between −10 and 0 on BUSS R meter, stop and rewind the tape to 000.

10. Push the RECord key. The first three tracks are now being recorded onto track 4. The RECord Function LED will stay on.

11. Once the recording is done, press STOP then REWind.

12. Set the BUSS R RECORD FUNCTION switch to SAFE. The LED will stop blinking.

13. With the MONITOR switch in the CUE position, adjust the track 4 TAPE CUE control to the proper level and listen to the results.

Another feature of the PORTA 05 is the ability to mix a new signal or signals with the tracks being PING-PONGED. The method is simply a combination of steps previously explained. Using the example above, we can add the new signal by using input channel 4 and following the steps below:

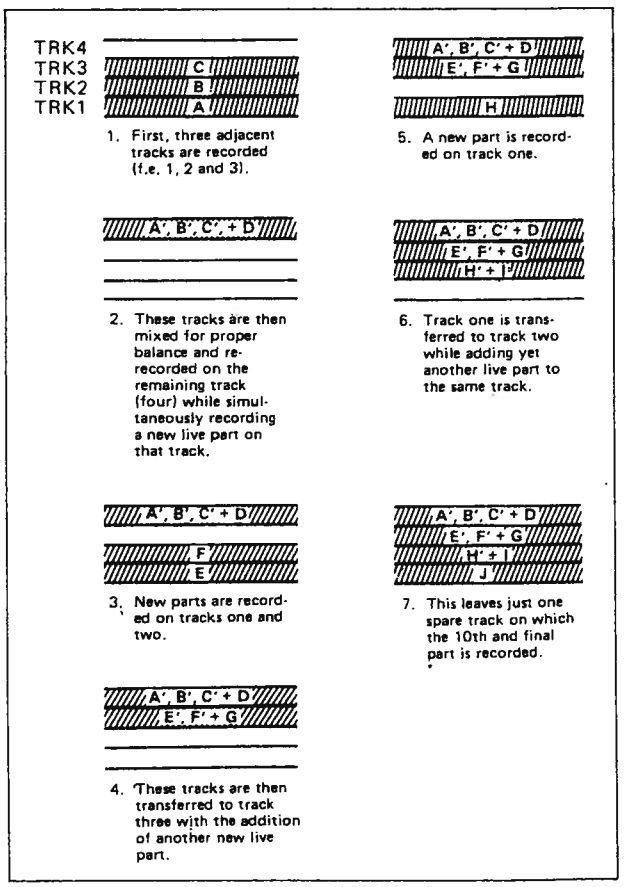
①After Step 4 above, plug the new line level source into channel 4.

②Set the fader level to the shaded area.

③Set the PAN fully right.

Now, continue on with Steps 5, 6 and 7 of the PING-PONG section. When you reach Step 8, balance the new signal with the previous tracks and rehearse the new material until the balance and timing are right. Then proceed with steps 9 – 13. Once the PING-PONG is completed to your satisfaction, you can re-record over the material on Tracks 1, 2 and 3.

With this technique you can record up to four different sounds on track 4. Once you have mixed the first three tracks plus the new, live material onto track 4, you can re-record and PING-PONG new material on tracks 1, 2 and 3. Even if you record only one live source during each collapse, you can record up to 10 tracks of material on the PORTA 05 without re-recording any track more than once (see the chart). For example, we've just shown you how to record three tracks (1, 2 and 3) plus a live signal onto the fourth track. Since 1, 2 and 3 are now available for recording again, use 1 and 2 for new overdubs, then collapse them, with a live source, onto 3. Already you have seven signals or tracks on only 2 tracksl Go back to track 1, overdub, then PING-PONG it with a new source onto track 2 (this makes 9). Finally use track 1 again for the tenth signal. Ten track recording — not bad for a cassette.


TRK4
TRK3
TRK2
TRK1
C
B
A
1. First, three adjacent tracks are recorded (i.e. 1, 2 and 3).
A', B', C' + D'
2. These tracks are then mixed for proper balance and re-recorded on the remaining track (four) while simultaneously recording a new live part on that track.
A', B', C' + D'
F
E
3. New parts are recorded on tracks one and two.
A', B', C' + D'
E', F' + G
4. These tracks are then transferred to track three with the addition of another new live part.
A', B', C' + D'
E', F' + G
H
5. A new part is recorded on track one.
A', B', C' + D'
E', F' + G
H' + I'
6. Track one is transferred to track two while adding yet another live part to the same track.
A', B', C' + D'
E', F' + G
H' + I'
J
7. This leaves just one spare track on which the 10th and final part is recorded.

Remix or Mixdown

The last step in any basic recording is mixing the finished multi-track master tape into a standard stereo format. This process is known as REMIXING DOWN. During this procedure the tracks are blended together and balanced to create the desired sound. Other procedures or techniques can also be used during this process, but first we will describe the basics, then we will show you another trick, called PUNCH-IN.

Since the idea of mixing is to bring the four tracks down to two, you need another, two-track, cassette recorder which will act as the MASTERING deck.

1. Connect the Left and Right LINE OUT jacks of the PORTA 05 to the line inputs of the mastering deck.

2. Switch all four channels to Tape by disconnecting all input sources from the MIC/LINE and LINE connectors of the PORTA 05.

3. Set the PAN controls to the center (12 o'clock) position.

4. Set the channel and MASTER faders to 7.

5. Set the MONITOR switch to REMIX.

6. Turn the TAPE CUE controls all the way to the left counteclockwise or off.

7. Rewind the recorded tape to 000.

8. Push PLAY and, with the headphones on, adjust the PHONES level control to a comfortable listening level.

9. Using the channel PAN and fader controls, set each track's level and left-to-right position for the desired balance. You will have to decide what "sounds right" at this step, we can only tell you what controls to adjust, but not where to set them.

10. When the signal balance and level sound right, set the overall level using the MASTER fader.

11. Rewind the tape and push PLAY. Adjust the input levels on the MASTERING deck until its meters read between about –3 to 0.

12. Rewind the tape again. Put a fresh tape in the MASTERING deck and let it play for 10 to 15 seconds, then stop it and reset the MASTERING deck's counter to 000.

13. You are now ready to record the mix. Put the MASTERING deck into its RECORD mode, then push PLAY on the PORTA 05. Continue to monitor the process through the headphones. When the recording is done, stop both machines, rewind the stereo MASTER and listen to the mix.

NOTE: During recording or remixing, the signals can be monitored, or heard, two ways:

1. through headphones, which we have discussed previously, and

2. through monitor speakers.

This latter approach requires some care and common sense, as using speakers when an open microphone is used as a signal input can, and usually does, cause feedback or howling.

In order to use your PORTA 05 with speakers, you will need an external stereo amplifier. Plug a dual RCA plug cable into the LINE OUT jacks (L and R). Connect each to the corresponding tape or Aux Inputs on the amplifier. Set its volume to 0 *before* you connect the PORTA 05 to it. When you are ready to monitor, make sure you turn the PORTA 05 *before* turning on the amplifier. When finished, turn the amplifier off *before* turning off the PORTA 05.

Quite often, during either the initial track recording or remix, it becomes apparent that the recorded material contains a mistake or could be improved. One obvious way to correct this problem is to re-record the entire track, but, if the mistake is minor, this is not practical or necessary. The PORTA 05 was designed to allow you to easily correct or add material using the technique known as punch-in or insert recording. This provides a way to re-record only a small portion of a track, thus covering the mistake, or to record addional material on a blank spot of another track, augmenting the original material. The technique used has, for the most part, already been covered. Only the way in which it is accomplished is different. There are two ways of performing the punch-in or insert. We will describe both.

Punch-In or Insert Recording

Using our orignal first track recording, let's say we've discovered a small error. There wasn't enough of a pause between two odd numbers, thus the track two material, the even numbers, overlaps and audibly "steps on" track 1 at that one small point. Here's how to fix it:

1. Play the tape up to a point several seconds before the error. Push the RESET button to mark this point.

2. Plug the mic into channel 1. (Whatever is connected to channels 2, 3, and 4 should be disconnected.)

3. Set the channel controls just as before.

4. Set the RECORD FUNCTION switches. The BUSS L switch to track 1, the BUSS R to SAFE.

5. Set the MONITOR switch to CUE.

6. Turn the TAPE CUE controls for tracks 1 and 2 to about 12 o'clock.

7. Press PLAY. The two tracks should be heard through the headphones. Adjust the PHONES control and TAPE CUE controls to the desired volume and balance.

8. Adjust the fader and TRIM controls on channel 1 while speaking into the mic. Set the PAN control all the way to the left. Balance the new signal with the recorded one.

9. Rehearse the Punch-In by rewinding the tape and pressing PLAY. Speak along with the recorded signal, making the necessary corrections.

   Once you are satisfied with the rehearsals, rewind the tape and perform the actual Punch-In.

10. Press PLAY and, as in the rehearsal, speak along with the material. When you reach the point JUST BEFORE the error, press RECord. Continue speaking, making the corrections required.

11. When the Punch-In has been performed correctly, press STOP.

12. Rewind the tape and listen to the Punch-In. If the results are satisfactory, continue with your recording. If the PUNCH-IN is not to your liking, go back and try again.

The PORTA 05 can also perform the Punch-In process another way. On the left side panel of the unit you will find a 1/4" phone jack marked REMOTE PUNCH IN/OUT. By using the optional remote foot switch, model RC-30P, the process can be accomplished without having to manually press the RECord and STOP keys. This is really handy if you are recording alone and are too busy playing an instrument to push the switches. Here's how it's done:

Plug the RC-30P foot switch into the PORTA 05.

Follow steps 1—9 as described above. When you get to Step 10, follow the instruction below:

10. Press PLAY and, as in rehearsal, speak along with the material. When you reach the point just before the error, press the RC-30P foot switch. The RECord Function LED should stay on, indicating the PORTA 05 is recording. Make the necessary corrections to the track, then;

11. Press the foot switch again. This takes the PORTA 05 out of RECORD and into PLAY. The RECord Function LED should begin to flash.

12. As before, STOP and REWind the tape and listen to the results.

Before we finish this portion of the manual, here are a couple of tips for performing quality Punch-Ins.

Always try to punch-in when there is a signal present on another track. This will mask any slight noise from the electronics. The same applies to punching-out.

Always rehearse your punch-in until it's PERFECT. Remember, once you punch-in over existing material, that recorded signal is erased. Make your mistakes in the rehearsal, not on tape.

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Recording with Effects

Reverb, delay, compressor, overdrive, chorus, phaser, sampler, flanger, echo, limiter, de-esser; the list goes on and on. Recording today requires the extensive use of signal processors, effects, that come in various shapes and sizes from footpedal "squash boxes" to professional rack-mount units. Your PORTA 05 is very flexible and powerful in the way it handles signal processing and effects.

Your MINISTUDIO can process all, or any combination of, your mixer channels with effects using its built-in Effects submix system. The EFF control in each of the channels of your mixer is used to send, in amounts varied by the control, signal to the Effects submixer. Signals from the channels are summed together and sent to EFFECT OUT. Your PORTA 05 has a dedicated EFFECT RTN jack to bring the signals from your effects loop back into the unit.

Recording with Tape Sync

Your PORTA 05 has a special feature designed to make it an ideal recorder to be used with electronic musical instruments. SYNC OUT is specifically designed to be used with the recordable synchronizing codes used by MIDI (Musical Instrument Digital Interface) and some other instrument systems. While MIDI itself is a computer type digital language, it is necessary to convert MIDI sync signal to recordable sync signal such as FSK (Frequency Shift Keying) using a MIDI FSK converter. Sometimes this type of converter is implemented on sequencers, drum machines and computer interfaces.

You may record your sync signal via the LINE connector on INPUT 4 to track 4, via Buss R before you lay any tracks. Connect the FSK output of your MIDI FSK converter, drum machine, sequencer, computer interface (whatever you're using to generate your sync code) to the LINE 4 input on the front panel. The FSK output might be labelled "Sync Out" or "Tape Out". Set the transport to Record Sync on track 4. Consult the owner's manuals of your electronic instruments for specifics. To record new synchronized tracks using your sequencers etc., reverse the process. Connect SYNC OUT of the PORTA 05 to the "Sync In" (or "Tape In") of your converter. Put track 4 into play mode and any tracks you want to record into Record Ready mode. Your converter will translate the sync code playing back from track 4 into MIDI clock information which, in turn, will drive the MIDI program in the sequencer (notes, rhythm, bends, etc.) The synthesizers, drum machines, and other sources and processors connected to your sequencer will now operate in perfect sync. In this way you can continue to record the audio signals from your sound sources on the MINISTUDIO's tracks during Overdubs, Ping-pongs, and Remix in sync. Consult sections of this manual with these headings for more information. Tracks created electronically using sequencers etc. are called "Virtual Tracks". Combing virtual tracks with the normal tracking procedures used in recording makes it possible to record a tremendous number of different instrument sounds on a very small number of tape tracks. Your only real limitation is the number of sound sources and the capacity of your sequencer.

NOTE: When recording sync signals, make sure you have suffieient level, which should register between −10 and 0 on the BUSS R meter. Adjust the level using the channel 4 fader. Or, connect the sync signal to channel 1, or 2. Necessary level adjustments can then be made using both TRIM and fader.

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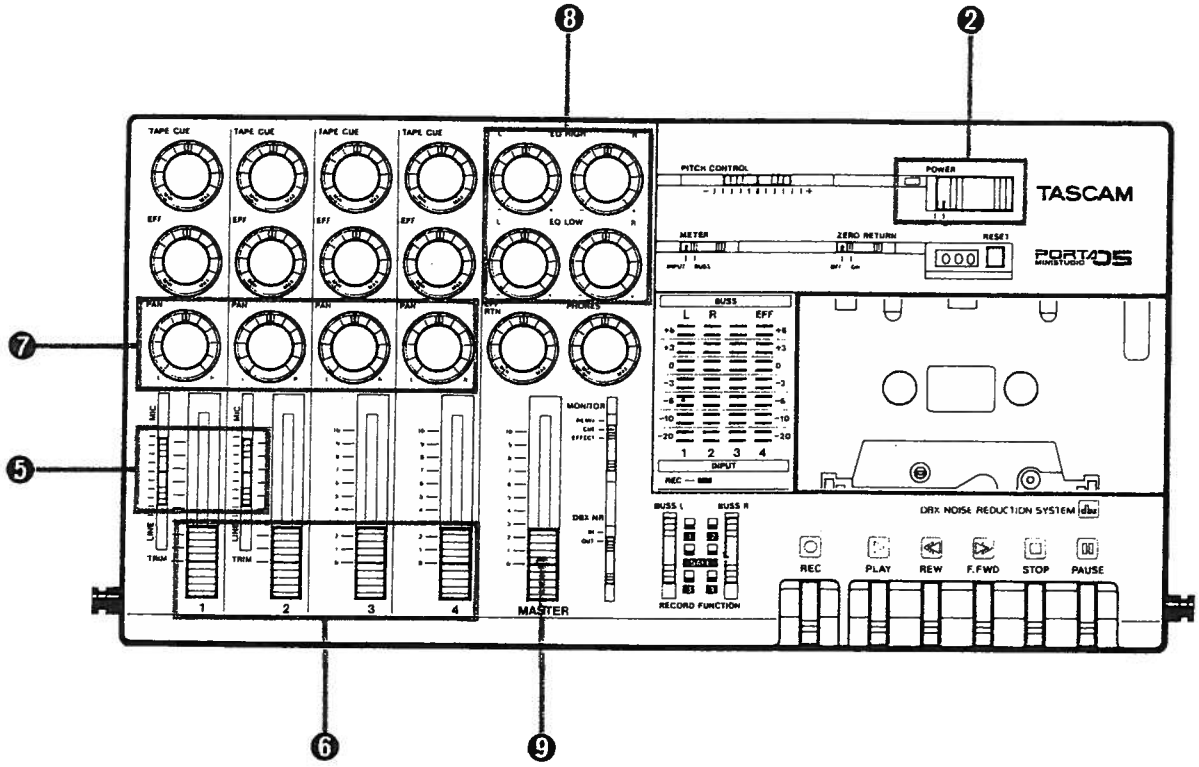
Features and Controls



❶ DC IN Jack

This jack is used to connect the provided PS-P2 AC adapter.

❷ POWER Switch and LED

Setting it to the right, ON position switches power to the PORTA 05 on and the LED lights, setting it to the left, OFF position turns the PORTA 05 off.

❸ MIC/LINE Input Connector—Channels 1 and 2 Only

This 1/4" phone jack accepts unbalanced signals from any type of microphone having any impedance from 150 ohms to 10,000 ohms. You can also connect any magnetic instrument pick-up, electric guitar or bass, or an electronic keyboard. There is usually no need for a "direct box" or transformer. However, some situations may require such a device.

When signal is connected to this jack, the mixer channel switches to this input signal. When the signal is disconnected from this jack, the channel switches to the built-in recorder (channel 1 to track 1 and channel 2 to track 2).

❹ LINE Input Connector—Channels 3 and 4

As opposed to the input connector on channels 1 and 2, this 1/4" phone jack only accepts unbalanced line level signals.

As with channels 1 and 2, channels 3 and 4 also switch to the recorder outputs when signal is disconnected from this LINE jack (track 3 is routed to channel 3 and track 4 to channel 4).

❺ TRIM—Channels 1 and 2 Only

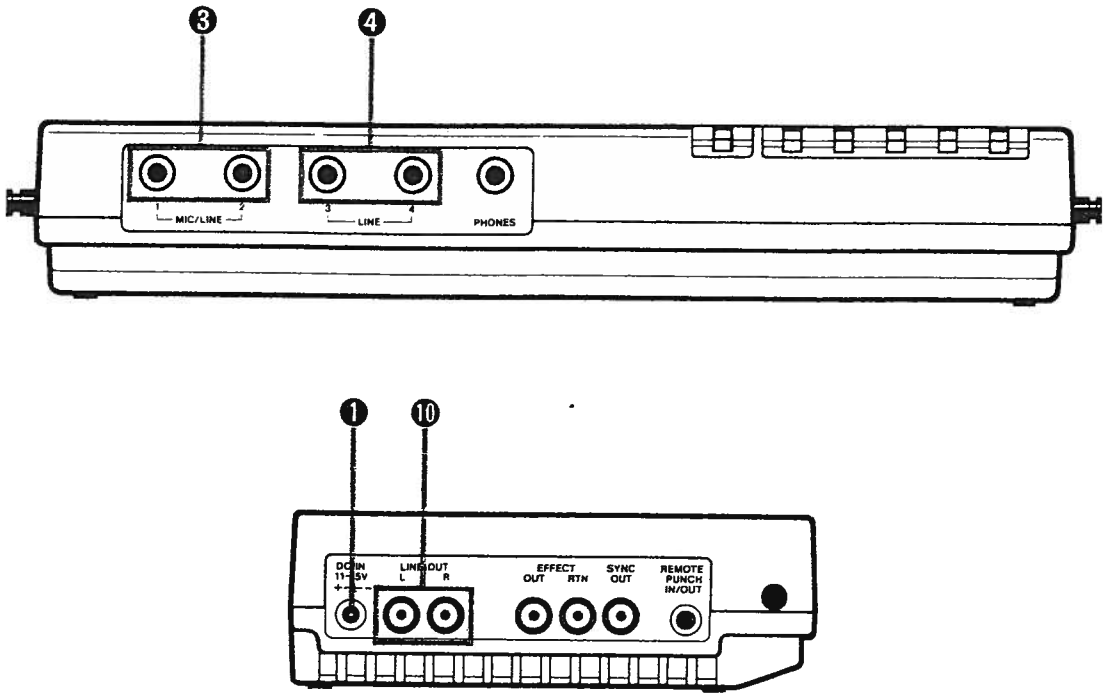
This control alters the gain of the first amplifier, it will affect the level of MIC/LINE signals but has no effect on the TAPE signals. The amount of increase or gain that the amplifier gives the signal is determined by TRIM control. The TRIM control allows you to adjust the amplifier to handle a wide variety of signal levels. Pushing up the TRIM control causes the amp to give more gain when working with mic's or softer sound sources. Pulling down the TRIM reduses the amount of gain when working with high level mic or line level signals or louder sound sources.

❻ Input Fader

This linear, or slide, fader varies the amount of signal going from the input channel to the Stereo Left and Right (L/R) Output Busses via the PAN control. This channel fader is the main mixing control for adjusting how much of the input appears at the output(s).

❼ PAN

The PAN control is used to assign (send) the input channel's signal to the Stereo Busses. The PAN provides continuously variable assignment to the L Buss (full counterclockwise rotation) and the R Buss (full



clockwise rotation). This allows you to make stereo mixes and locate an input channel's signal anywhere in the stereo panorama.

⑧ EQualizers (L and R)
The equalizer or EQ is the circuitry that allows you to adjust the tonality of the signal or mix of signals assigned to the Stereo L and R Busses. It is a two-knob type, with the high knobs allowing a boost or cut of 10 dB at 10 kHz for the high frequencies, and the low knobs allowing a boost or cut of 10 dB at 100 Hz for the low frequencies of the L and R Busses. They work similarly to the bass and treble knobs on other audio equipment.

CAUTION: The PORTA 05's EQ is located in the L and R Busses (after the PAN, before the MASTER fader). To prevent the Busses from being overloaded, reduce the MASTER fader before turning the EQ knobs up. For the same reason the METER select switch should be set to the BUSS position, when using the EQ.

We've included a chart of the frequency characteristics of some musical instruments so you can get a better idea of how these tone controls can be used to the best artistic advantage. Of course, using them and hearing the results will tell you exactly how they work.

For more information on EQ, see How to Use the PORTA 05's Equalizer on page 18.

⑨ MASTER Fader
This linear (slide) fader controls the level of the signal or mix of signals assigned to the L and R Busses. It simultaneously adjusts the signal level at the:

1. LINE OUT jacks Left and Right.
2. The Buss L and Buss R meters when the METER select switch is in the BUSS position.
3. RECORD FUNCTION select switch.
4. MONITOR switch/PHONES level control.

⑩ LINE OUT Jacks (L and R)
This pair of RCA jacks feed a line-level program mix (from the Stereo Left and Right Busses) to a monitor amp or tape recorder. This is the same mix you hear in the headphones when the PORTA 05 monitor select switch is in REMIX, except the LINE OUT level is controlled only by the MASTER Fader and not by the PHONES control.

CAUTION: Never connect two PORTA 05 outputs directly together via a "Y" adaptor or similar method. Doing so would connect both output amps together leading to circuit failure.

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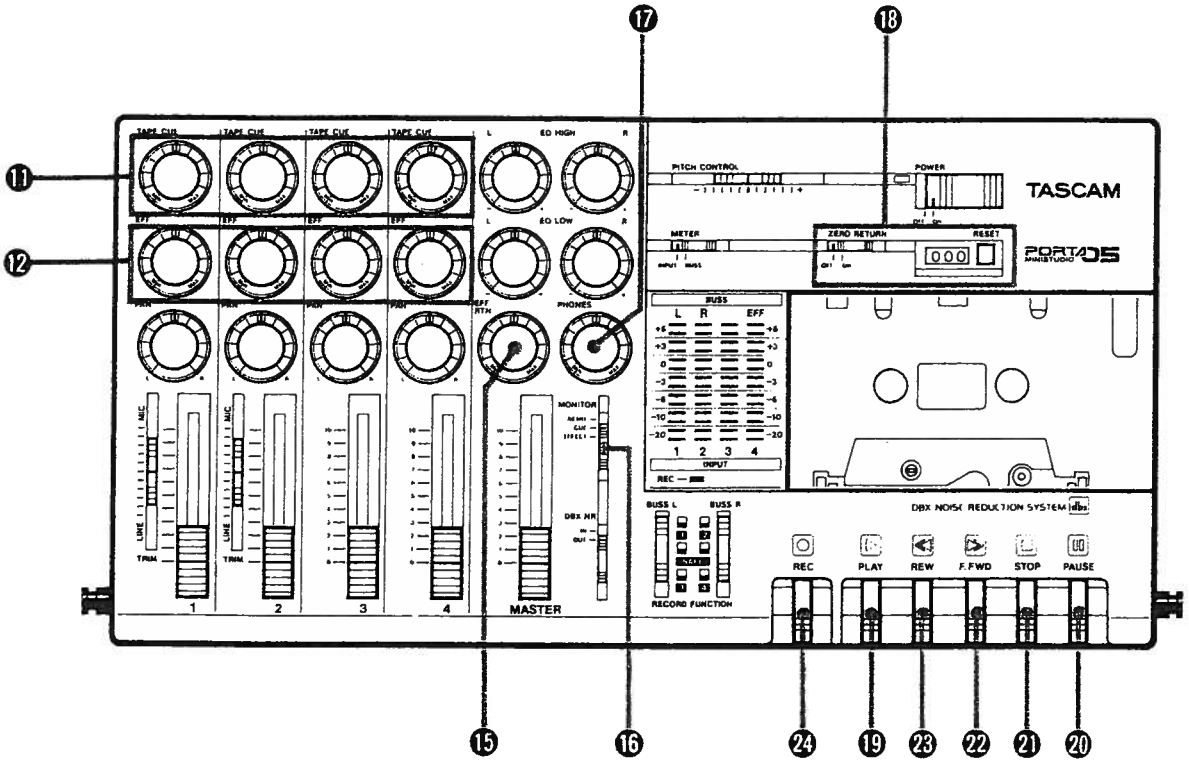
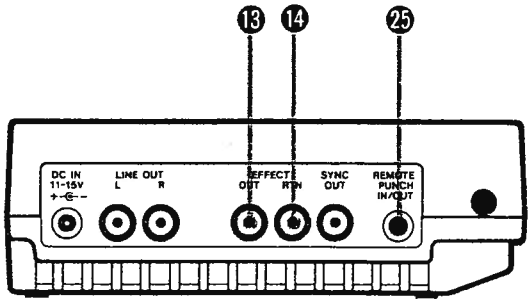




⓫ TAPE CUE
These 4 knobs, corresponding to Tracks 1 through 4, are used to create a mono mix of any existing tracks (already recorded tracks) during playback. The Tape Cue mix is always fed to the MONITOR Select switch.

⓬ EFF (Effect) Send Level Control
These 4 controls determine how much signal in the corresponding channels will be routed to the EFFECT OUT. Take-off point is after fader and before PAN.

⓭ EFFECT OUT
The signal from this jack is usually taken to a signal processor or effects loop.

NOTE: Consult "Recording With Effects" found on page 11.

⓮ EFFECT RTN (Return) Jack
The signal(s) orignating at the EFFECT OUT and processed by your effects devices are usually returned to the PORTA 05 at this jack.

⓯ EFF RTN (Effect Return) Level Control
This control is used to adjust the signals plugged into the EFFECT RTN jack before those signals reach the EQ then the MASTER fader.

⓰ MONITOR (Headphones) Select Switch
What you will hear in the headphone circuit will be controlled by this switch.

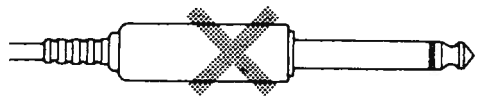
REMIX – You will hear the stereo output of the L and R Busses. The levels you will hear are affected by the settings of the MASTER Fader and the PHONES level control. In this position the TAPE CUE controls have no effect on what you hear in the headphones.

CUE – You will hear a Mono combination of the MASTER fader signal plus the Tape Cue signals, one for each track. The TAPE CUE controls have signals available to them only after the track has been recorded. To hear them you must be in the CUE (mono) mode.

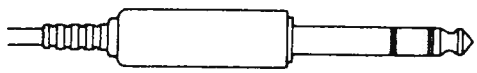
EFFECT – You will hear the EFFECT OUT (mono). The listening level in the headphones is affected by the settings of the Input Channel Fader, the EFF send level control, and the PHONES volume control.

⑰ PHONES
The PHONES control adjusts the overall level of your headphones, plugged into the front panel jack. Any change in the setting of the TRIM, Input Faders, MASTER Fader or the TAPE CUE controls will change the signal level in the phones.

CAUTION: MONO (2-WIRE) HEADPHONES WILL CAUSE CIRCUIT FAILURE. If your headphones have this connector, don't use them.



(1/4" phone 2-connector)



(1/4" phone 3-connector)

Using the 2-wire connector shorts out one of the amplifiers driving the headphones, which will cause it to burn out.

TRANSPORT SECTION

⑱ RESET and ZERO RETURN
The Tape Counter is useful for locating any specific point on a tape. The Tape Counter can be reset to 000 at any time by pressing the RESET button located to the right of the counter.

Being able to return to any desired point on a tape can be very helpful. If the ZERO RETURN switch is set to the right, ON position, the tape will automatically stop during REWind when the Tape Counter reaches 000. All you have to do to return to a specific point is reset the Tape Counter to 000 at the point you wish to return to and set the ZERO RETURN to the right, ON position. The tape will always stop at that point when you use the REWind function.

After the tape has stopped when using ZERO RETURN, pressing the REW button again starts rewinding beyound the 000 point. The tape will automatically stop at its beginning.

NOTE: ZERO RETURN works only in rewind, tape motion will not stop at 000 in the Fast Forward mode.

⑲ PLAY Button
Pressing this button places the transport in the PLAY mode. The end stop mechanism releases all functions when the tape reaches its end. Pressing the F. FWD or REW button during playback will enable you to locate at high speed by monitoring the tape, a desired recorded portion or the end of a program.

NOTE: Monitoring the tape at a high speed will cause high level, very high-frequency audio signals to appear at the outputs. Be sure that you turn down the output/monitoring level prior to using this function, so that the headphones or speaker units will not be damaged by excess high frequency.

⑳ PAUSE Button
Disengages the pinch roller from the capstan while playing or recording a cassette, which causes the tape to stop running. The electronics remain engaged. To enter RECORD/PAUSE, press PAUSE, then REC. To resume playing or recording, press the PAUSE button again.

㉑ STOP Button
Pressing this button stops any tape motion, and cancels the Record mode.

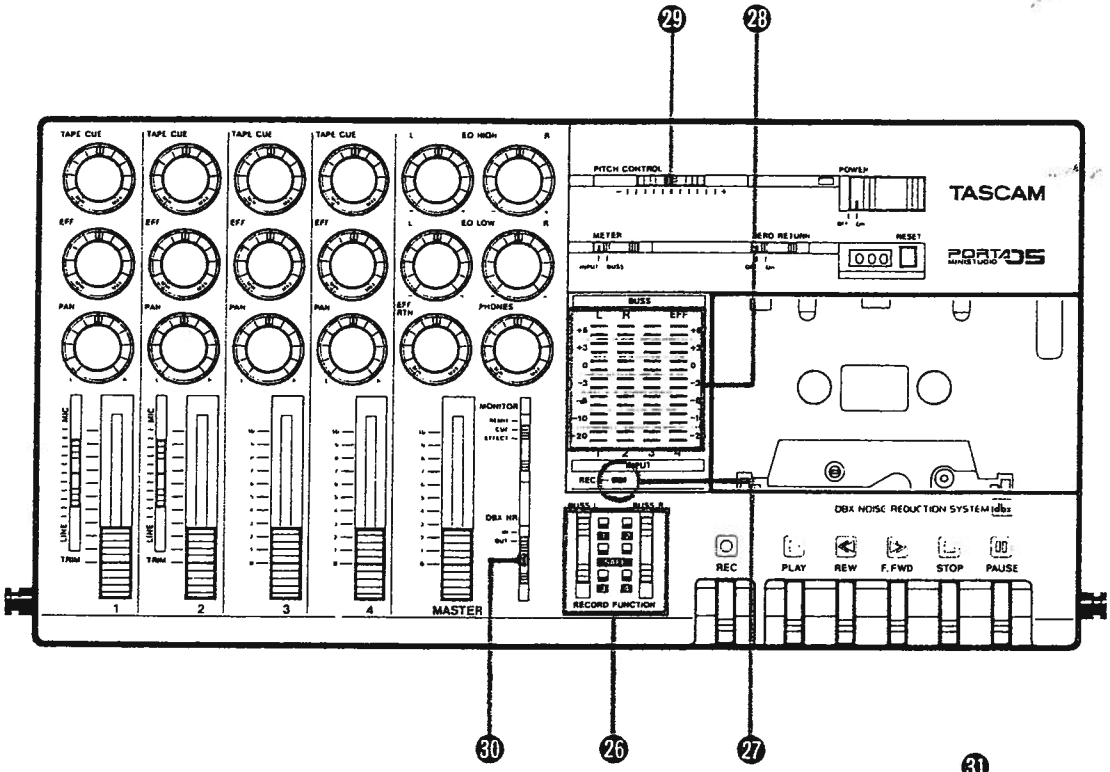
㉒ F. FWD Button
Pressing this button winds the tape forward at high speed. When the tape reaches its end, the transport will automatically stop.

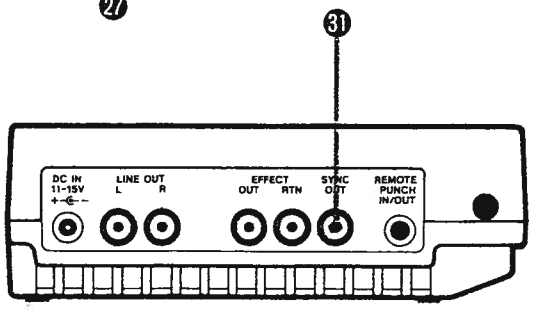
㉓ REW Button
Pressing this button rewinds the tape at high speed. When the tape reaches its beginning, or when the ZERO RETURN stop position is reached, the transport will automatically stop.

㉔ REC Button
Pressing this button begins the recording process by activating the record electronics selected by the RECORD FUNCTION switches and starting tape motion. Recording cannot be done if both RECORD FUNCTION switches are set to the SAFE position or the record protection tabs are missing on a cassette. Check the RECORD FUNCTION switches or the cassette tabs if the PORTA 05 does not enter Record.

㉕ REMOTE PUNCH IN/OUT Jack
This 1/4" (6.3 mm) phone jack, on the left side panel of the PORTA 05, is for the optional RC-30P Remote Punch In/Out pedal. Whether you're a busy engineer, producer, or a musician with both hands on an instrument, there are those times when you can't drop what your doing to press the RECord button. You need a third hand! The RC-30P can be that third hand. It lets you punch in and out of RECORD with a tap of your foot.

NOTE: The RC-30P does NOT work in conjunction with the REC button. If you enter the Record mode with the REC button you cannot terminate the Record mode with the RC-30P you must use the STOP button.





CAUTION! The optional RC-30P is active, if a RECORD FUNCTION switch is set to the Record Ready mode, regardless of the removal of the record safety tabs.

㉖ RECORD FUNCTION Switches

The PORTA 05 mixer has only two Output Busses. (Left and Right) which are internally connected to the RECORD FUNCTION switches. The Left switch assigns the L Buss to either Track 1 or Track 3 and Right switch, R Buss to either Tracks 2 or 4. Setting either of the RECORD FUNCTION switches to a track, makes the RECord Function LED flash to indicate that the PORTA 05 is in "Record Ready" mode.

Switch Position	Buss L	Buss R	Indicator
Up	1	2	Yellow
Center	Safe	Safe	Green
Down	3	4	Yellow

㉗ RECord Function LED

This LED indicates any of the tracks' record status ("Record Safe", "Record Ready" or "Record" mode):

a). LED off: "Record Safe" mode – no recording can take place.

b). LED blinks: "Record Ready" mode – indicates that one or both busses have been assigned to a track. Whether the tape is stopped or in play, the PORTA 05 is ready to go into record, but not yet recording.

c). LED on: Record or Record/Pause – the recorder is recording or is ready to begin recording by releasing the PAUSE button.

㉘ Peak Level Meters and the METER Select Switch

The four vertical meters of the PORTA 05, have different functions, depending on the switch position, input or buss.

INPUT– in this position meter 1 through 4 will show the source level if a source is connected to the input.
– if no source is connected to the input the meter will show playback, the numbers of the meters being the same as the channels.

BUSS— in the buss position the meters will display the buss output levels.
Meter 1 will show the left buss output
Meter 2 will show the right buss output
Meter 3 will show no signal
Meter 4 will show the effects send buss output

NOTE: Unless recording two sources or more on a single track at a time, that is, as long as you record on a channel-by-channel basis, there is no need of selecting the INPUT position to see the source levels then selecting the BUSS position to see the EQ levels. You can use the BUSS position from the begining. See also #8.

㉙ PITCH CONTROL

Sliding this contol allows you to adjust the speed of the PORTA 05 by approximately ±15% in both record and playback modes. Sliding the knob to the left (–) slows the tape, while sliding it to the right (+) speeds up the tape. You can return to the basic speed of 1 7/8 ips (4.8 cm/sec) by setting it at the center detented position.

The PITCH CONTROL offers you a variety of creative possibilities. It may prove somewhat tricky to adjust because we wanted to give you the greatest possible range of speeds, and thus had to compromise on "fine tuning". For use with musical material this allows pitch changes of at least a 3rd to a 5th. Which provides a convenient way to add difficult vocal harmonies. In any case, we suggest that you use "full slow" or "full fast" only during final playback, as minor drifts in this control circuit from hour to hour may result in slight speed variations. If for example, you use "maximum" during recording, you will not be able to make a minor "upward" correction during playback because you will have no leeway.

Also, it is recommended to make a run of several seconds in the play mode for the speed to stabilize, especially when the change in speed is large. Before beginning to record again, check the pitch carefully with a short playback, and you will have less trouble with drift.

CAUTION: dbx NR calibration will only be accurate at the basic speed of 1 7/8 ips (4.8 cm/sec). Recording at one speed and playing back at another may cause dbx decoding errors to have an effect on the dynamics of the signal. Since changing the speed of the tape will also alter the pitch (frequency) of recorded sounds, the use of this speed shift circuitry will be an artistic judgement we must leave to you. The specifications on page 24 for the unit may not be achievable when this circuit is used on extremes.

㉚ DBX NR Switch

When playing a dbx-encoded tape or making a dbx NR recording, this switch must be set to the upper, IN position.

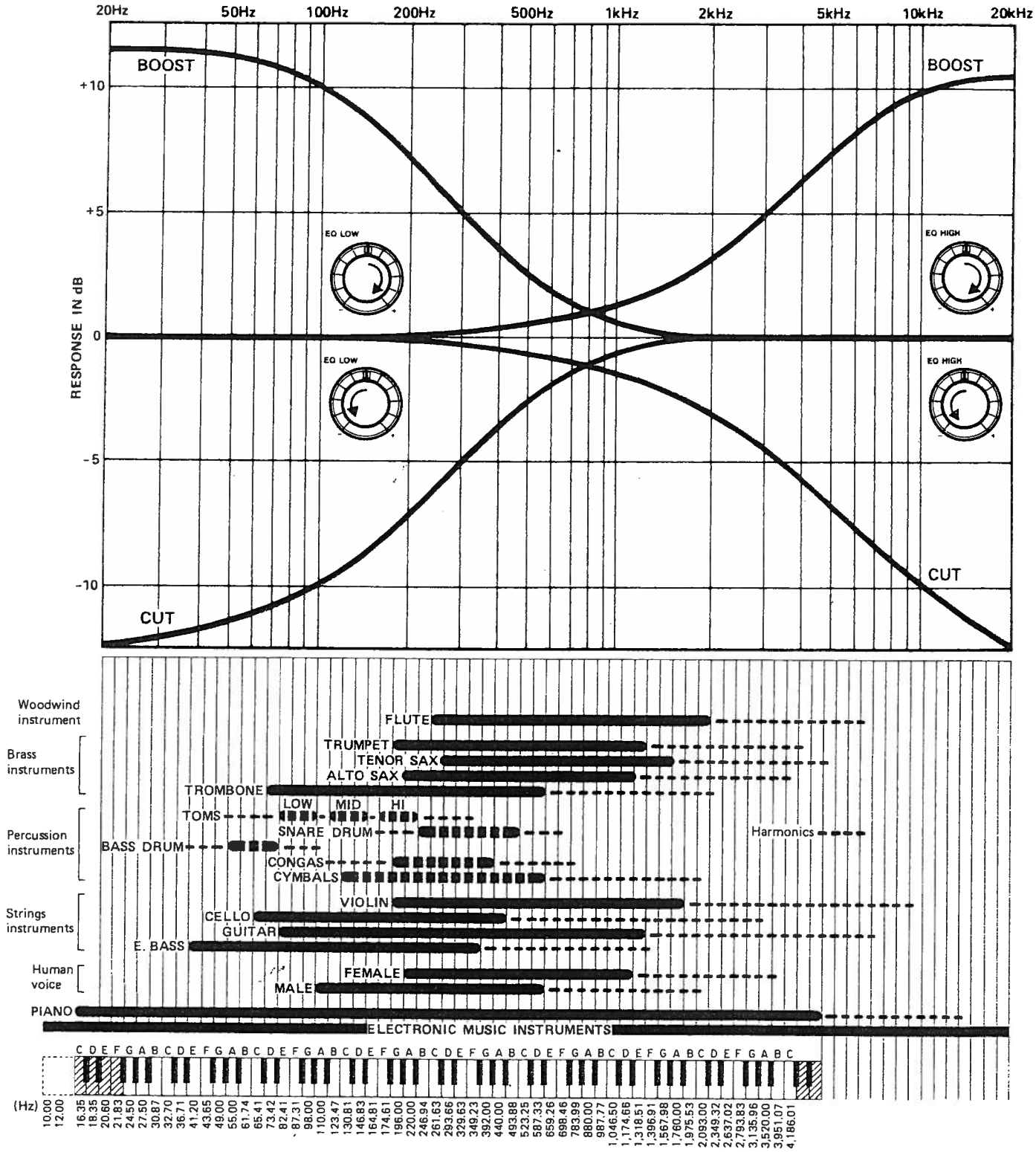
㉛ SYNC OUT Jack

This jack should be used to route out the sync signal to your sequencer, drum machine or computer interface. Before the sync signal reaches this jack it will be conditionned by a band-pass filter, which optimizes the quality of the sync signal.

How to Use the PORTA 05's Equalizer

EQ can be used to change the tonality of an individual instrument. The 10 kHz control affects the "brightness" or "brilliance" of an instrument, and the 100 Hz control affects the "boominess" or "bassiness" of an instrument.

It is important to remember that there are two ways to make a given tonal change. If you want to add 10 kHz, for example, you can get a similar effect by turning down the 100 Hz. If you want more in the low frequency range, you can turn



down the 10 kHz and get a similar tonality change.

In general terms, you get a desired tonal change in two ways. Either make the appropriate change on the control that affects the range you want to alter, or make the opposite change on the control that affects the opposite frequency range.

The equalizer on the PORTA 05 is a two-knob shelving type, and its range of control covers the low and high frequencies. To use an equalizer, it is important to understand the frequency range of the sound sources you will be processing and the control range of the equalizer. Refer to the illustration on the proceding page to see the relationship between the frequency range of various instruments, and the range of control of the PORTA 05's equalizer.

This illustration shows how different instruments will be affected by changes in the EQ settings. You can see how certain instruments will be unaffected by changes on one of the EQ controls. Cymbals and flutes, for example, will not be affected very much by the 100 Hz EQ. This is because these instruments have little or no frequency content in that range. On the other hand, you can boost or cut a certain part of an instrument without boosting or cutting other parts of that instrument. On drums, for example, you can bring out the kick drum relative to the other drums by turning up the 100 Hz control. On the other drums that have a little frequency content in that range there will be some effect. Because the kick drum has a large amount of energy in the 100 Hz range, it will be the most affected by changes on the 100 Hz control.

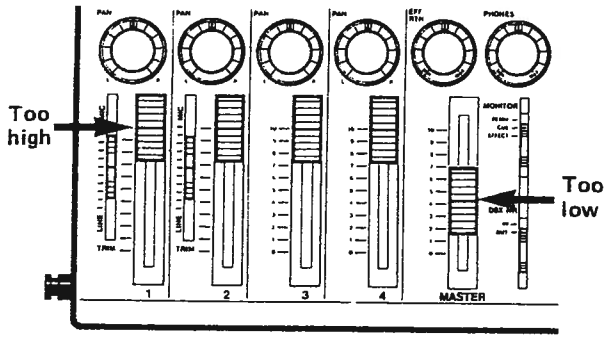
Likewise, if you want to accentuate or diminish the cymbals in a drum kit, you can do so using the 10 kHz control. Turn it up for more and down for less. This, too, will affect any other source (signal) that has frequency content in that range. Experience will show you that there is a limit to how much cut or boost you can do before its effects on the other signals become undesirable.

As before, experience will help you learn the capabilities and limits of this method.

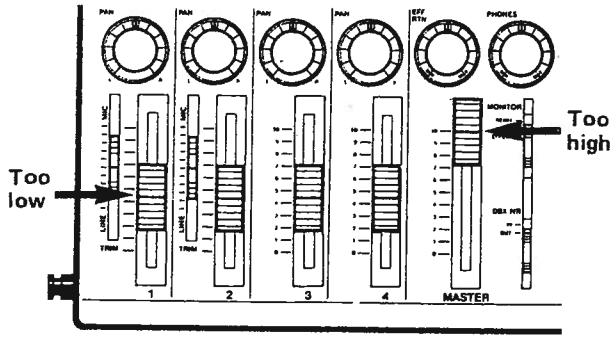
A Word of Mixing Advice

All finished tapes must be balanced — one sound and its tone judged by blending with others. Don't depend on EQ to set up a "perfect" tone, because the minute you add your perfect sound back to the "mix" the tone may not be so "perfect". Always try to get the levels as close to "right" as possible before using EQ. If the mix is close, you will know which tracks need fine EQ tuning to be heard. Less EQ means less distortion and full boost on every pot will also boost the noise in your mix as well as the signal.

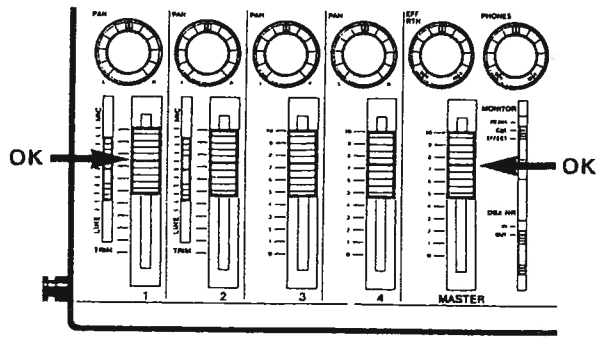
1. If your console faders always wind up like this, you are likely to be over-loading your outputs. Pull down the inputs and raise the master.



2. Conversely, if this is what you usually have, you are getting too much gain from your master. Your mix is clean, but noisy.



3. This picture is a reasonable compromise and is probably better all around.

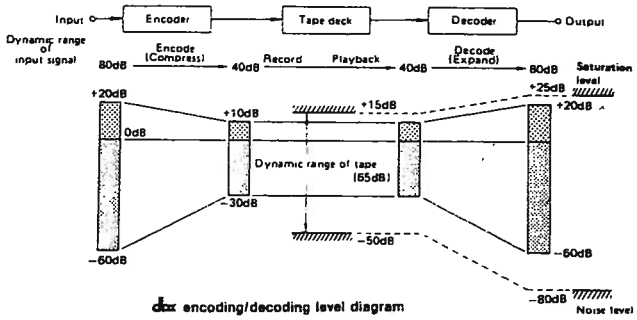


How the dbx Works

The DBX is a wide-band compression-expansion system which provides a net noise reduction (broadband, not just hiss) of a little more than 30 dB. In addition, the compression during recording permits a net gain in tape headroom of about 10 dB.

A compression factor of 2:1 is used before recording; then, 1:2 expansion on reproduce. These compression and expansion factors are linear in decibels and allow the system to produce tape recordings with over a 90 dB dynamic range — an important feature, especially when you're making live recordings. The DBX employs RMS level sensors to eliminate compressor-expander tracking errors due to phase shifts in the tape recorder, and provides excellent transient tracking capabilities.

To achieve a large reduction in audible tape hiss, without danger of overload or high-frequency self-erasure on the tape, frequency pre-emphasis and de-emphasis are added to the signal and RMS level sensors.



dbx encoding/decoding level diagram

SUBSONICS AND INTERFERENCE

The DBX incorporates an effective bandpass filter. This filter suppresses undersirable subsonic frequencies to keep them from introducing errors into the encode or decode process. However, if rumble from trains or trucks is picked up by your microphone and fed to the DBX-modulation of the program material during low level passages may occur. This low-frequency component will not itself be passed through the recorder and so, will not be present at reproduce for proper decoding. If this low-level decoding error is encountered, and subsonics are suspected, we suggest the addition of a suitable high-pass filter in the Microphone Line.

Care and Maintenance

Even though the head used in the PORTA 05 has high wear resistance and is rigidly constructed, performance degradation or electro-mechanical failure can be prevented if maintenance is performed regularly. Periodically follow the check items below:

CLEANING

The first things you will need for maintenance are not expensive. The whole kit with the swabs and fluids you will need for months will cost less than a couple of high-quality cassettes.

We cannot stress the importance of cleaning too much. Clean up before each session. Clean up after every session. Clean up every time you take a break in the middle of a session.

Cleaning the Heads and Tape Guides

All heads and metal parts in the tape path must be cleaned after every 6 hours of operation, or before starting and after ending a recording session. Using a good head cleaning fluid and a cotton swab, clean the heads and tape guides until the swab comes off clean. Wipe off any excess cleaning fluid with a dry swab.

Cleaning the Pinch Roller

Clean the pinch roller at least once each day the deck is used. Use a good rubber cleaner.

1. Open the cassette door.
2. Press PLAY.
3. Lightly press a cotton swab moistened with rubber cleaner to the pinch roller on the right-hand side of the capstan shaft. This will prevent the swab from becoming entangled. Clean it until there is no visible residue on the pinch roller or coming off a clean swab.
4. Using a clean cotton swab, wipe off all excess rubber cleaner from the pinch roller. Make certain that there is no foreign matter remaining on either the pinch roller or the capstan shaft.

Cleaning the Capstan Shaft

After cleaning the pinch roller, clean the capstan shaft. Lightly press a cotton swab moistened with head cleaning fluid to the rotating capstan shaft.

DEGAUSSING (DEMAGNETIZING)

A little stray magnetism can become quite a big nuisance in tape recording. It only takes a small amount (.2 Gauss) to cause trouble on the record head. Playing 10 cassettes will put about that much charge on the heads. A little more than that (.7 Gauss) will start to erase high-frequency signals on previously recorded tapes. You can see that it's worth taking the trouble to degauss regularly.

DEGAUSSING IS ALWAYS DONE WITH THE RECORDER TURNED OFF. If you try it with the electronics on, the current pulses produced by the degausser will look just like audio signals to the heads. These pulses are around 10,000 Gauss, and will seriously damage the electronics and/or meters. Turn off your PORTA 05, then turn on the degausser at least 1 m (3 feet) away from the recorder.

Be certain that your degausser has either a plastic cover or plastic tape covering the tip. Make sure that no metal ever touches the tape heads as it will scar them and ruin them.

Slowly move in to the tape path. Move the degausser slowly up and down, touching lightly all metal parts in the tape path. Slowly move it away again to at least 1 m (3 feet) from the recorder before turning it off.

Be sure to concentrate while you are degaussing. Don't try to hold a conversation or think of anything else but the job you are doing. If the degausser is turned on or off by accident while it is near the heads, you may put a permanent magnetic charge on them that no amount of careful degaussing will remove. You will have to get the heads replaced. Make sure you are wide awake for this job.

A clean and properly demagnetized tape recorder will maintain its performance without any other attention for quite a while. It won't ruin previously recorded materail, nor will getting it back to original specifications be difficut.

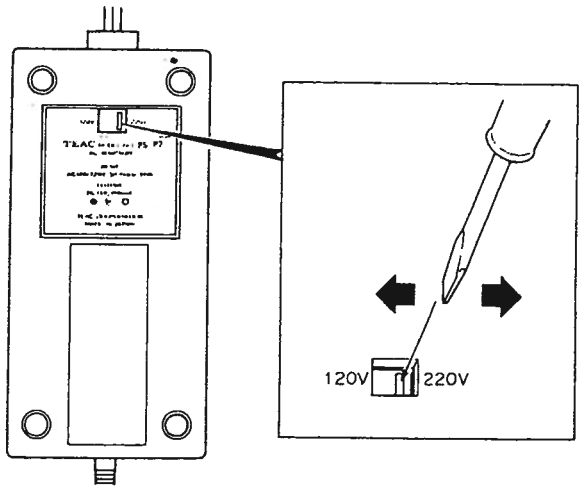
CAUTION: If the surface of the unit gets dirty, wipe the surface with a soft cloth or use a diluted neutral cleaning fluid. Clean off thoroughly. Do not use thinner, benzine, or alcohol, as they may damage the surface of the unit.

Use of the PS-P2 AC Adaptor

If for any reason you won't be using the PORTA 05 for a period of time, it's always a good idea to remove the AC adaptor from the unit and the AC line.

Notes: 1. For General Export units the voltage setting can be changed to match your mains power. ALWAYS DISCONNECT THE AC LINE BEFORE MAKING THE CHANGE.

1. Locate the voltage selector on the top panel of the PS-P2.



2. Two voltage ranges are available: 120 V (110 – 120 V) and 220 V (220 – 240 V). Using a regular (slot-bladed) screwdriver, set the selector to the indication corresponding to the voltage requirements of your area.

II. This voltage conversion is NOT possible on units sold in the North America, U.K., Australia or Europe.

III. U.K. Customers
Due to the variety of plugs used in the U.K., the PS-P2 is sold without an AC plug. Please request your dealer to install the correct plug to match the mains power outlet where your unit will be used as per these instructions.

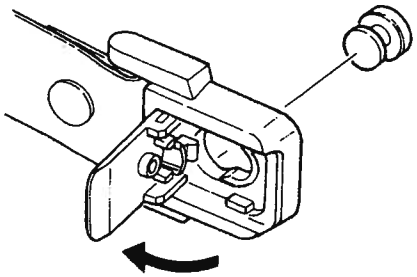
Optional Accessories for the MINISTUDIO PORTA 05

CS-P5 Carrying Case

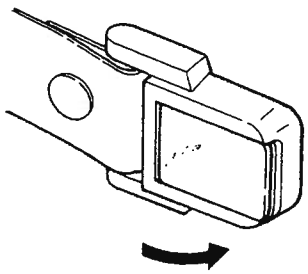
As its name implies the PORTA 05 is very portable and there will be times when you will want to take it with you. Use the CS-P5 to protect the PORTA 05.

The shoulder strap supplied with the CS-P5 can be attached to the PORTA 05 by using the following simple procedure:

1. Pull open the retainer latch in the direction indicated by the arrow.



2. Slip the buckle over the stud on the side of the PORTA 05.

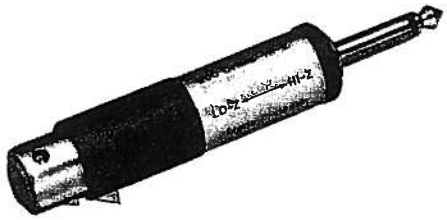


3. Snap the retainer latch shut to secure the buckle.

RC-30P Remote Punch-In/Out Pedal

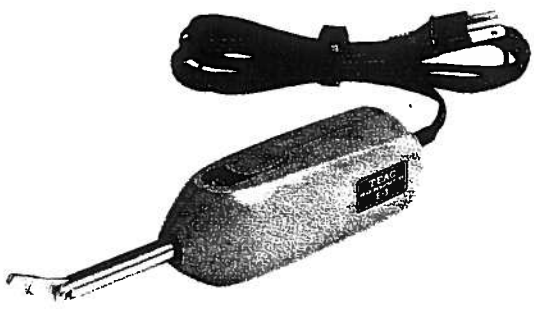
The RC-30P is a durable footswitch that connects to the REMOTE PUNCH IN/OUT jack on the front panel of the PORTA 05. This permits "hands free" entry and exit from the record mode.

109B Input Transformer

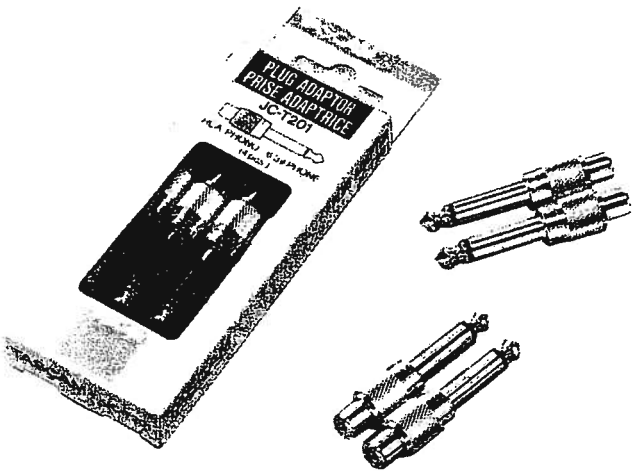


The TASCAM 109B Input Transformer is an adaptor that matches balanced low impedance microphones with XLR connectors to unbalanced high impedance 1/4" phone jack inputs. This adaptor enables a long cable from the low impedance mic to remain balanced for rejection of hum and buzz, and also properly loads the mic to preserve correct frequency response.

E-3 Head Demagnetizer



JC-T201 Plug Adaptor (RCA Phono → 1/4" Phone)



Designed to pro standard for optimum strength and sound quality with the male and female connectors machined out of one piece of metal.

TASCAM Cables

Cable, because of its inherent capacitance and resistance, is an active component in an audio system. There are vast differences in cable design and performance that have significant effect on the sound quality you'll get from your equipment. TASCAM Professional Audio Cables are the best available.

If TASCAM professional cables are not available in your area, please try to find the next best cables. It really does make a difference in system performance.

TZ-261 Cleaning Kit (Except U.S.)

HC Head Cleaner & RC Rubber Cleaner (U.S. Only)

Specifications

MECHANICAL CHARACTERISTICS

Tape	Compact Cassette, 70 μs, Hi-bias (Type II) Tape
Track Format	4-track, 4-channel
Head Configuration	2 heads (erase and record/ reproduce)
Motor	1 servo motor
Tape Speed[1]	4.8 cm/s (1-7/8 ips) ±1%
Pitch Control	±15%
Fast Winding Time	Approx. 100 seconds for C-60
Wow and Flutter[1]	0.05%(NAB weighted) ±0.1%peak (DIN/IEC/ ANSI weighted)
Dimensions (WxHxD)	360 x 60 x 182 mm (14-3/16"x2-3/8"x7-3/16")
Weight (net)	2.0 kg (4.41 lbs)

ELECTRICAL CHARACTERISTICS

MIXER SECTION

Mic/Line Input (x2)	
Source Impedance	10 kohms or less
Input Impedance	50 kohms
Nominal Input Level	Mic, -50 dBV (3 mV), Trim Max. Line, -10 dBV (0.3 V), Trim Min.
Minimum Input Level	-60 dBV (1 mV), Trim Max. Channel Fader Max.
Maximum Input Level	+6 dBV (2.0V), Trim Min.
Line Input (x2)	
Input Impedance	10 kohms
Nominal Input Level	-10 dBV (0.3 V)
Line Output (x2)/Effect Output (x 1)	
Output Impedance	100 ohms
Nominal Load Impedance	10 kohms
Minimum Load Impedance	2 kohms
Nominal Output Level	-10 dBV (0.3 V)
Effect Return	
Input Impedance	10 kohms
Nominal Input Level	-10 dBV (0.3 V)
Headphone Output (Stereo x1)	
Nominal Output Impedance	8 ohms
Maximum Output Level	100 mW + 100 mW (8 ohms)
Equalizer	
Type	Shelving
Frequencies	LOW: 100 Hz HIGH: 10 kHz
Boost/Cut Range	±10 dB

RECORDER SECTION

Record Channel	4
Playback Channel	4
Noise Reduction	dbx* Type II NR (all tracks)
Sync Output	
Output Impedance	100 ohms
Nominal Load Impedance	10 kohms
Minimum Load Impedance	2 kohms
Nominal Output Level	-10 dBV (0.3 V)
Power Requirement	
Via AC Adaptor (Supplied PS-P2)	
USA/CANADA	120 V AC 60 Hz, 11W
GENERAL EXPORT	120/220 V AC 50/60 Hz, 12 VA.
EUROPE	220 V AC 50 Hz, 12 VA.
U.K/AUSTRALIA	240 V AC 50 Hz, 12 VA.

PERFORMANCE CHARACTERISTICS

Frequency Response[2]	40 Hz to 12.5 kHz, ±3 dB (dbx OUT)
Signal-to-Noise Ratio[2] **(Referenced to 3%THD)**	85 dB (IHF "A" WTD) (dbx IN)
Total Harmonic Distortion (THD)	1.0 % (1 kHz, 0 VU, dbx IN)
Channel Separation	55 dB (1 kHz, 0 VU, dbx IN)
Erasure	70 dB (1 kHz)

SUPPLIED ACCESSORY

AC adaptor PS-P2

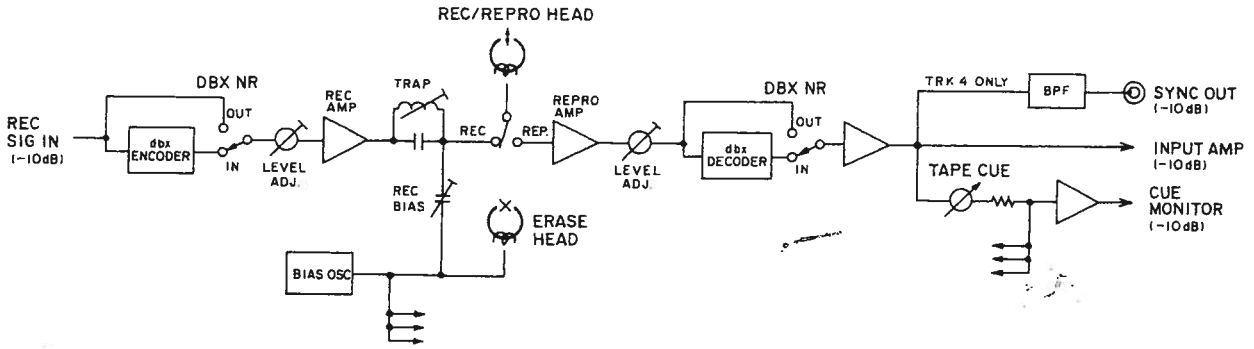
In these specifications, 0 dBV is referenced to 1.0 Volt. Actual voltage levels are also given in parenthesis (0.316 V for -10 dBV is rounded of and given as 0.3 V). To calculate the 0 dB = 0.775 Volt reference level (i.e., 0 dBm in a 600-ohm circuit), add 2.2 dB to the listed dB value; i.e., -10 dB re: 1 V = -7.8 re: 0.775 V.

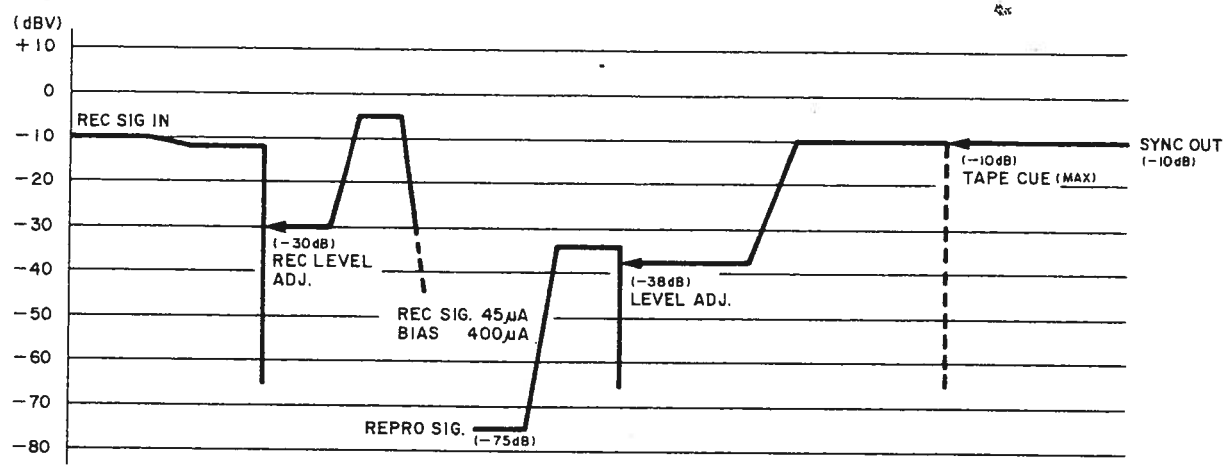
1) Specifications were determined using TEAC Test Tape MTT-111DN.
2) Specifications were determined using TEAC Test Tape MTT-5561 (blank tape).

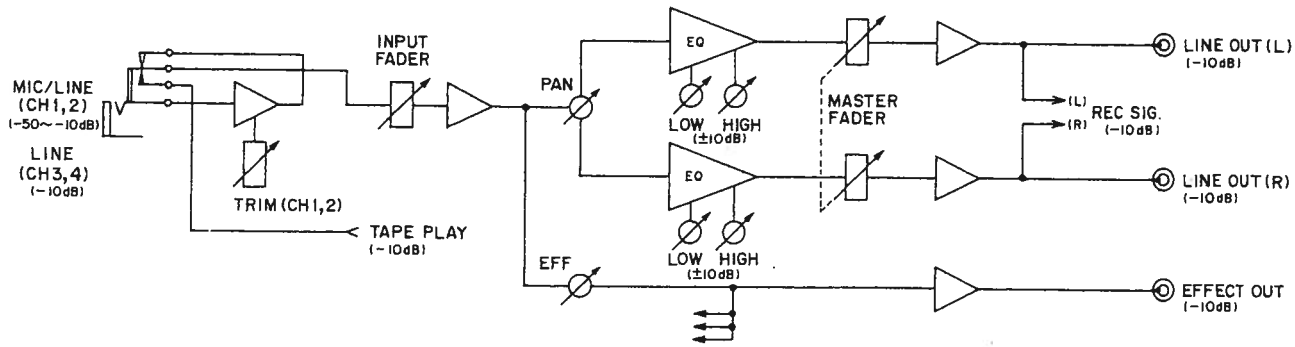
Changes in specifications and features may be made without notice or obligation.

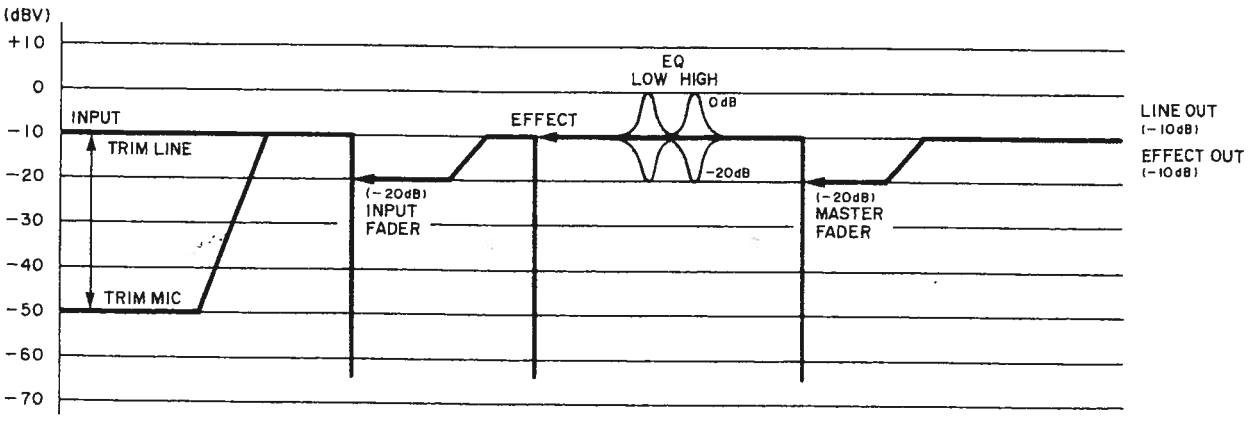
*dbx is a registered trademark of dbx Incorporated.

Level Diagrams









TASCAM

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